



**CALIFORNIA STATE SCIENCE FAIR  
2004 PROJECT SUMMARY**

<b>Name(s)</b> <b>Timothy L. Uy</b>	<b>Project Number</b> <b>S1220</b>
<b>Project Title</b> <b>Algorithm Performance on the Satisfiability Problem</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective was the find an effective method to solve the Satisfiability problem. <b>Methods/Materials</b> Methods 1. Write the Clause Check subprogram 2. Write a program to generate random problems with the ability to regenerate problems 3. Write the Genetic algorithm 4. Write the GSAT algorithm 5. Write the Simulated Annealing algorithm 6. Write the Exhaustive algorithm 7. Make sure the algorithms run properly 8. Run a 100 clauses 10 variables problem with the Genetic algorithm, GSAT, and Simulated Annealing. Do this 10 times for each algorithm 9. Repeat step 8 for 200 clauses and 20 variables, 300 clauses and 30 variables, 400 clauses 40 variables, 500 clauses and 50 variables, 10 clauses and 10 variables, 30 clauses and 30 variables, 50 clauses and 50 variables, 42 clauses and 10 variables, 127 clauses and 30 variables, 212 clauses and 50 variables. 10. Record data and analyze which algorithm had a higher performance level in terms of states taken to achieve a solution, and number of clauses satisfied  Materials 1 Computer Software: Microsoft Visual C++ Introductory Edition Compiler Microsoft Word Microsoft Excel <b>Results</b> The Hillclimbing algorithm performed worse, in terms of the number of clauses satisfied. The Genetic algorithm performed the worse, in terms of number of states taken to find a candidate. <b>Conclusions/Discussion</b> The Simulated Annealing Performed the best out of all algorithms	
<b>Summary Statement</b> To find out which out of the three algorithms will solve the Satisfiability Problem most effectively	
<b>Help Received</b> I would first like to thank my mentor, Dr. Kibler. I would also like to thank SCAS for their support.	